ſide, it will be all rais'd on the other, which way ſoever the fluid was directed. For the bur round the outſide of the hole, is the effect of the exploſion every way from the center of the ſtream, and not an effect of the direction.

In every ſtroke of lightning, I am of opinion that the ſtream of the electric fluid, moving to reſtore the equilibrium between the cloud and the earth, does always previouſly find its paſſage, and mark out, as I may ſay, its own courſe, taking in its way all the conductors it can find; ſuch as metals, damp walls, moiſt wood, *&c.* and will go conſiderably out of a direct courſe, for the ſake of the aſſiſtance of good conductors; and that, in this courſe, it is actually moving, tho' ſilently and imperceptibly, before the exploſion, in and among the conductors; which exploſion happens only when the conductors cannot diſcharge it as faſt as they receive it, by reaſon of their being incompleat, diſunited, too ſmall, or not of the beſt materials for conducting. Metalline rods, therefore, of ſufficient thickneſs, and extending from the higheſt part of an edifice to the ground, being of the beſt materials and compleat conductors, will, I think, ſecure the building from damage; either by reſtoring the equilibrium ſo faſt as to prevent a ſtroke, or by conducting it in the ſubſtance of the rod as far as the rod goes, ſo that there ſhall be no exploſion but what is above its point, between that and the clouds.

If it be aſk'd, what thickneſs of a metalline rod may be ſuppos'd ſufficient? In anſwer, I would remark, that five large glaſs jars, ſuch as I have deſcribed in my former papers,

pers, diſcharge a very great quantity of electricy, which nevertheleſs will be all conducted round the corner of a book, by the fine filleting of gold on the cover, it following the gold the fartheſt way about, rather than take the ſhorter courſe through the cover, that not being ſo good a conductor. Now in this line of gold the metal is ſo extremely thin as to be little more than the colour of gold, and on an octavo book is not in the whole an inch ſquare, and therefore not the 36th part of a grain according to M. *Reaumur*; yet 'tis ſufficient to conduct the charge of 5 large jars, and how many more I know not. Now, I ſuppoſe a wire of ¼ inch diameter to contain about 5000 times as much metal as there is in that gold line, and if ſo, it will conduct the charge of 25,000 ſuch glaſs jarrs, which is a quantity, I imagine, far beyond what was ever contain'd in any one ſtroke of natural lightning. But a rod of half an inch diameter would conduct four times as much as one of a quarter.

And with regard to conducting; tho' a certain thickneſs of metal be required to conduct a great quantity of electricity, and, at the ſame time, keep its own ſubſtance firm and unſeparated; and a leſs quantity, as a very ſmall wire for inſtance, will be deſtroy'd by the exploſion; yet ſuch ſmall wire will have anſwer'd the end of conducting that ſtroke, tho' it become incapable of conducting another. And conſidering the extream rapidity with which the electric fluid moves without exploding, when it has a free paſſage, or compleat metal communication, I ſhould think

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